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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,112	04/11/2005	Vincent Gaud	0608-1008	5065
465 7590 03/24/2008 YOUNG & THOMPSON 209 Madison Street Suite 500 ALEXANDRIA, VA 22314			EXAMINER MCCLENDON, SANZA L	
			ART UNIT 1796	PAPER NUMBER
			MAIL DATE 03/24/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/510,112

**Applicant(s)**

GAUD ET AL.

**Examiner**

Sanza L. McClendon

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 39-91 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 77-79 and 81-88 is/are allowed.
- 6) ☒ Claim(s) 39, 40, 49, 50, 53, 54, 63, 65, 6, 75 and 89 is/are rejected.
- 7) ☒ Claim(s) 41-48, 51, 52, 55-62, 64, 66, 68-74, 76, 80, 90 and 91 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-918)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/04/2004
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 53-54, 63, 65, 67 and 89 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 53, depends from claim 38, which is cancelled. Claims 54, 63, 65, and 67 depend from claim 53, which depends on a cancelled claim. Clarification is requested.
4. It is unclear in claim 54, where the photo-cleavable moiety is linked to since R6, R7, R8 and R9 are all defined as indicated in said claim. Clarification is requested.
5. Claim 89 provides for the use of the photosensitive adhesive composition in claim 39, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 89 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

6.

### *Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:  
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 39-40, 53-54 and 75 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Crane et al (6,657,031 and 2002/0089067).

Crane et al teaches re-workable thermosetting underfill/encapsulation adhesive resin compositions. Said resin composition comprises (a) a curable resin component, a portion of which is a curable compound having at least one thermally cleavable linkage, (b) an optional, inorganic filler component, and (c) a curing agent, such as an amine, anhydride, amide and/or imidazole. Said cleavable linkage is defined in column 6, lines 64 to column 7, and lines 1-5. The examiner deems that the thermally cleavable compounds of Crane et al reads on the instant invention. Said compounds have at least two polymerizable epoxide groups surrounding said cleavable linkage. While it is understood that Crane et al teaches thermal cleavage and not photo-cleavage of said groups, it is known that radiation sources provide thermal energy/heat during exposure, as well as, capable of being localized and having shorter exposure times, i.e., sources of thermal heating. Therefore, it would have been obvious to a skilled at the time of the invention to use a radiation source (i.e., a known device/method) to provide the necessary heat (i.e., a predictable result) to cleave the re-workable centers as defined by Crane et al in the absence of evidence to the contrary and/or unexpected results. The motivation would have been a reasonable expectation of obtaining a thermally re-workable underfill adhesive having the same and/or improved success as taught by Crane et al in column 15 in the absence of evidence to the contrary and/or unexpected results.

9. Claims 39-40, 53-54 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crane et al (7,109,061).

Crane et al teaches re-workable thermosetting underfill/encapsulation adhesive resin compositions. Said resin composition comprises (a) a curable resin component, a portion of which is a curable compound having at least one thermally cleavable linkage, (b) an optional, inorganic filler component, and (c) a curing agent, such as an amine, anhydride, amide and/or imidazole. Said cleavable linkage is defined in column 18, lines 56-69. The examiner deems that the thermally cleavable compounds of Crane et al read on the instant invention. Said compounds have at least two polymerizable epoxide groups surrounding said cleavable linkage. While it is understood that Crane et al teaches thermal cleavage and not photo-cleavage of said groups, it is known that radiation sources provide thermal energy/heat during exposure, as well as, capable of being localized and having shorter exposure times, i.e., sources of thermal heating. Therefore, it would have been obvious to a skilled at the time of the invention to use a radiation source (i.e., a known device/method) to provide the necessary heat (i.e., a predictable result) to cleave the re-workable centers as defined by Crane et al in the absence of evidence to

the contrary and/or unexpected results. The motivation would have been a reasonable expectation of obtaining a thermally re-workable underfill adhesive having the same and/or improved success as taught by Crane et al in column 24 in the absence of evidence to the contrary and/or unexpected results.

10. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nuyken et al (Journal of Polymer Science: Part A Polymer Chemistry, vol. 35 (1997), pages 3017-3025)

Nuyken et al sets forth polyesters having photo-cleavable triazine centers which appear to have hydroxyl end groups from the scheme 4. Since hydroxyl groups are known polymerizable groups, the compounds of Nuyken et al appear to render claim 39 obvious.

11. Claims 39-40, 49-50, 53-54 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuczynski et al (5,872,158) as evidenced by Crane et al (6,657,031 and 2002/0089067).

Kuczynski et al sets forth cleavable diacrylate having the formula set forth in the abstract, wherein the acetal group is the cleavable portion. Kuczynski et al sets forth said acetal group is cleavable by hydrolysis or transesterification; however as can be seen in Crane et al the same groups are known to be thermally cleavable also. And since it is known that radiation sources provide thermal energy/heat during exposure, as well as, capable of being localized and having shorter exposure times, i.e., sources of thermal heating. Therefore, it would have been obvious to a skilled at the time of the invention to use a radiation source (i.e., a known device/method) to provide the necessary cleaving reaction (i.e., a predictable result) to cleave the re-workable centers as defined by Kuczynski et al in the absence of evidence to the contrary and/or unexpected results.

#### ***Allowable Subject Matter***

12. Claims 41-48, 51-52, 55-62, 64, 66-74, 76, 80, and 90-91 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: The prior art made of record fails to teach the instant limitations in a photosensitive adhesive composition as defined in claim 39.

14. Claims 77-79, and 81-88 are allowed.

15. The following is an examiner's statement of reasons for allowance: The prior art, alone or in combination, fails to teach a bifunctional monomer as defined in claims 77-79. The prior art, alone or in combination, fails to teach methods for preparing bifunctional monomers including a

photo-cleavable center comprising at least one photo-cleavable unit and at least two polymerizable units linked by covalent skeleton to said photo-cleavable center as defined in claims 82 and 84-86.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Firstly, the art cited in WIPO documents are deemed not to read on the instant claims because, while having photo-cleavable centers, they do not teach that said photo-cleavable centers are compounds that have at least two polymerizable units linked by covalent skeleton to said photo-cleavable center as instantly defined.

17. US Patent 6,008,266 teaches acid cleavable acetal containing diepoxy compounds in re-workable underfill adhesives. Ulbricht et al (6,515,039 teaches resins having photo-cleavable centers. The difference between Ulbricht et al and the instant claims are Ulbricht et al has only one polymerizable unit because the other is bonded to a support matrix. US 6,572,980 to Klemarczyk et al teaches re-workable thermosetting resin compositions having a thermal cleavable center, but fails to teach two polymerizable groups linked via a covalent skeleton to said center. Johnson et al in *Macromolecules* 2007, 40, 3589-3598 and in *J. AM. Chem. Society* 2006, 128, 6564-6565 teaches photo-cleavable liner and star macromonomers. Nuyken et al in *Journal of Polymer Science: Part A Polymer Chemistry*, vol. 35 (1997), pages 3017-3025 sets forth polyesters having photo-cleavable triazine centers. Madhavan et al in *Chemistry Communications* sets forth synthesis and photocleavage of a new dimeric bis (o-nitrobenzyl) diether tether.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sanza L. McClendon whose telephone number is (571) 272-1074. The examiner can normally be reached on Monday through Friday 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sanza L. McClendon/

Primary Examiner

Art Unit 1796

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